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DISPLAY CASE FOR POSTERS

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DISPLAY CASE FOR POSTERS  
[Schaukasten für Plakate]

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The following information has been taken [unedited] from documents submitted by the applicant.

The invention relates to a display case for posters, consisting of an upright rear-wall structure for the poster to be displayed, a frame surrounding the rear-wall structure, and a front, transparent panel held in the frame.

Such display cases are used in practice as cases that stand up or are mounted on a wall. The poster or posters are attached by means of paste to the rear wall of the structure, wherein paste is coated over the entire rear surface of the posters. This produces a considerable consumption of paste, which becomes crucial, especially when taking into account the multitude of public display cases. Because the display cases are not air-tight, the changing weather conditions have the effect that the adhered posters become wavy, especially due to high humidity, so that when they are viewed, especially from the side, they become unclear and thus are negatively affected. Another disadvantage is that based on increasing vandalism causing broken front panels, there are considerable repair costs due to panel replacement. Here, the front panel must also be replaced when it becomes disfigured due to smudges and the like, apart from the fact that the poster can also

not be viewed perfectly in this case. In locations where high suction forces are generated due to passing vehicles, e.g., in train stations, the panel of the display case is destroyed by the suction forces or is ripped out of its holder in the frame relatively frequently.

The task of the invention is to improve a display case of the type mentioned in the introduction, which guarantees a perfect presentation of the poster without using paste and independent of the weather conditions, which features increased resistance to vandalism and thus reduces the repair costs, which withstands suction forces, and which is also easy to operate and economical to produce.

The solution of this task is that the display case mentioned in the introduction is refined such that the frame and the transparent panel form a one-piece unit made from plastic material and the unit is held in its closed position with its panel region contacting the poster side of the rear-wall structure and is held to this structure sealed against the atmosphere.

Based on this solution, the poster or posters are held pressed against the rear wall of the display case by the transparent panel region of the unit completely, i.e., over the entire surface. This produces the following advantages: the poster or posters no longer have to be pasted, which saves work time and paste, wherein posters that are no longer being used can be disposed of in an environmentally friendly way because of the lack of paste. The posters are no longer exposed to weather conditions, therefore they can no longer become wavy and condensation cannot form on the panel region from the inside, so that perfect viewing of the poster is guaranteed at all times. High suction forces due to passing trains in train stations or trucks cannot separate the panel region from the rear-wall structure, because the adhesive force (suction-cup effect) created by the outer atmospheric air pressure essentially exceeds the suction forces. In addition, breakage damage due to vandalism is no longer as cost-intensive, because the points of breaks on the panel region are relatively small due to the contact of the panel region of the unit on the rear-wall structure and due to the plastic material for the panel region. In addition, plastic repair of the panel region at the point of the break can be performed economically. The entire unit made from the frame and panel can be manufactured economically, wherein the thickness of the panel region can be selected to be relatively thin, but nevertheless achieving sufficient stability in terms of the unit. As the plastic, a pressure-setting plastic is preferably selected, which is distinguished, among other things, by high impact resistance.

In a preferred configuration of the display case according to the invention, the panel of the unit is held on the poster side of the rear-wall structure sealed by the use of a vacuum, wherein the frame can be provided with reinforcement. Furthermore, on the rear side of its poster-bearing wall, the rear-wall structure can have a vacuum channel which extends around the perimeter of the structure, which is attached to a vacuum pump, and which is connected via short channels to the

front side of the poster-bearing wall. In this way, a quick and uniform suctioning of the unit is achieved with simultaneous pressure of the poster or posters on the rear-wall structure.

The unit according to the invention can be provided on its outer side with a special coating. This coating permits easy removal of dirt and/or malicious painting.

In another configuration, the display case can be provided with an alarm system in order to immediately make known a vacuum defect and/or a destructive outside effect. For this purpose, the alarm system can be configured to transmit a radio alarm signal of limited range for a service vehicle of a poster service. Such a vehicle will receive the corresponding radio signal with simultaneous identification of the affected display case, so that repair can be started without delay.

The invention is explained in more detail in the following with reference to an embodiment shown in the attached drawings. Shown are:

Figure 1, a front view of the embodiment,

Figure 2, a side view of the embodiment,

Figure 3, a detail according to the arrow III in Figure 2 at an enlarged scale,

Figure 4, a device for operating the embodiment.

In Figures 1 and 2, a display case 2 mounted on upright stand 1 for posters 3 is shown. The structure 2 includes a rear-wall structure 4 and a unit 5 made from transparent material hinged to the structure. The unit 5 is preferably mounted to the rear-wall structure 4, so that the unit 5 can be separated sufficiently far from the structure 4 to allow the poster or posters 3 to be attached to the front poster side of the structure 4 by means of lateral hinge mechanisms 6. In Figure 2, the unit 5 is also shown in a position illustrated with dotted lines in order to indicate that the rear-wall structure 4 is freely accessible for exchanging posters 3.

The unit 5 preferably consists of a one-piece component, which includes a frame 7 and a transparent panel region 8. The one-piece unit preferably consists of a plastic material with low coefficients of thermal expansion. Such a material is a pressure-setting plastic, e.g., acrylic ester. This material can feature, if desired, glass-fiber reinforcement. The panel region can have a thickness, e.g., of 2 mm, and the frame 7 can have reinforcement 9, e.g., made from metal.

In an alternative embodiment, the unit 5 can also be formed in two pieces, i.e., the frame 7 and the transparent panel region 8 made from plastic form two parts which are connected rigidly to each other, e.g., by a threaded connection, wherein the two parts can be sealed against each other, so that an air-tight connection is produced, as will become clear.

In the illustrated case according to Figure 3, the rear-wall structure 4 includes a front rear wall 10 and a back rear wall 11, wherein the two wall parts form an intermediate space between them in which a device 12 for generating a vacuum is arranged. At each point contacting the poster 3, the front rear wall 10 is provided with a surrounding seal 13, which creates an air-tight seal of the inner region of the unit 5 against the atmosphere. On the rear side of the front rear wall 10,

there is a vacuum channel 14 which extends on the perimeter around the edge region of the rear wall 10 and which is connected via short channels 15 to the front side of the poster-bearing rear wall 10. The vacuum channel 14 is connected on the other side to a vacuum pump 16 of the vacuum device 12, so that after positioning the poster, including placing the unit 5 on the rear-wall structure 4, any air located between the rear wall 10 and the panel region 8 of the unit 5 can be drawn away.

Preferably, a vacuum reservoir 17 can be formed in the top region of the rear-wall structure 4. In this way, a large vacuum supply is always available, which guarantees that the unit 5 is then held reliably on the rear-wall structure 4 even if the panel region 8 has a leak, e.g., due to malicious destruction.

To simplify the pivoting of the unit 5 away from the rear-wall structure 4 for the operating personnel, an activation cylinder 18, which is also operated by the vacuum device 12, can be attached to the rear-wall structure 4. Likewise, securing cylinders with internal springs 20 can be provided on the rear-wall structure in order to secure the unit 5 against opening by force.

Figure 4 shows a block-circuit diagram for the operation of the vacuum device 12. In addition to the already mentioned components 14 and 16-20, a two-way valve 21 is provided, which interacts on one hand with the vacuum channel 14 and the cylinders 18 and 19 and which interacts on the other hand with the vacuum reservoir 17 and electronics 22. The electronics 22 are in constant connection with a vacuum sensor 23, which in turn interacts with the vacuum reservoir 17. The electronics in turn control the vacuum pump 16 when it has received a corresponding signal from the sensor 23.

When a new poster 3 is attached to the rear wall 10 of the rear-wall structure 4 and the front unit 5 has been pivoted against the structure 4, the surrounding seal 13 creates an air-tight closure of the connected unit 5 against the atmosphere. The electronics 22 now control the two-way valve 21 such that a vacuum is created in the vacuum channel 14, which also acts on the poster side of the front rear wall 10 of the rear-wall structure 4 via the short channels 15 and draws away the air located there. The atmospheric pressure now creates on one side a tight pressing of the panel region 8 of the unit 5 over the entire surface against the front rear wall 10, so that accordingly, on the other side, the poster or posters are pressed tightly and uniformly against the rear wall 10. In this way, the two valves 19 are ventilated and, in interaction with the unloaded springs 20, the unit 5 is locked by means of the locking body 19a of the cylinder 19. Similarly, the activation cylinder 18 is also located in the drawn back position. Simultaneously, in the vacuum reservoir 17, with the help of the pump 16, a reserve vacuum is generated, which is connected to the vacuum in the vacuum channel 14 via the valve 21. With the help of the vacuum reservoir 17, the pump 16 needs to feature only a relatively small output, because when the unit 5 is opened, the reservoir 17 is closed by the valve 21. If the vacuum in the channel 14 lessens due to a leak in the region of the

unit 5, then this is registered by the sensor 23 in the reservoir 17, which forwards this information to the electronics 22, which turns on the vacuum pump 16 in order to reinstate the prescribed level in the reservoir 17.

If the unit 5 is opened to exchange posters, the electronics 22 receives from an authorized person an opening pulse, which then controls the directional valve 21 in order to block the reservoir 17 and to release the vacuum in the channel 14. Simultaneously, a vacuum is formed in the cylinders 18 and 19 so that the unit 5 can be unlocked and opened.

In another configuration, the unit 5 can be provided with a paint-resistant and/or dirt-resistant coating on its outer side, especially in the region of the transparent panel 8. In this way, it is possible to easily remove malicious paintings, e.g., graffiti, from the outer side of the panel region 8. Furthermore, it is possible to provide the display case with an alarm system 24 in order to transmit a corresponding alarm signal, e.g., by means of radio, in the case of a vacuum defect. However, as an additional or alternative feature, the alarm system can also be configured such that an alarm signal is output when the panel region 8 of the unit 5 has been damaged by a malicious outside effect. The alarm system 24 then transmits, e.g., a radio signal of limited range which can be received by a service vehicle of a poster service, wherein the location of the affected display-case structure can also be identified. Because the poster service is constantly in transit, a damaged display case can be detected and corresponding repair can be started within a short time. Such alarm systems are known, so they do not need to be described in more detail here.

Finally, the rear-wall structure can also include an illuminating device 25 in order to illuminate the poster or posters 3 from behind. In this case, the front rear wall 10 of the rear-wall structure 4 is transparent, such that the poster or posters 3 are back-lit uniformly and without glare in a typical way. As an alternative to the application of a vacuum, in order to hold the unit 5 pressed to the poster side of the rear-wall structure, known sealing means can also be provided on the display case, with which the pressed position of the unit 5 can be secured. Similarly, there is then essentially no air between the panel region 8 of the unit 5 and the poster side of the rear-wall structure 4.

### Claims

1. Display case for posters, consisting of an upright rear-wall structure for the posters to be displayed, a frame surrounding the rear-wall structure, and a front, transparent panel held in the frame, characterized in that the frame (7) and the transparent panel (8) form a one-piece unit (5) made from plastic material and the unit (5) is held in its closed position with its panel region contacting the poster side of the rear-wall structure (4) and is held to this structure sealed against the atmosphere.

2. Display case according to Claim 1, characterized in that the unit (5) is held sealed on the poster side of the rear-wall structure (4) by applying a vacuum.

3. Display case for posters, consisting of an upright rear-wall structure for the posters to be displayed, a frame surrounding the rear-wall structure, and a front, transparent panel held in the frame, wherein the frame and the panel form a unit connected rigidly to each other, characterized in that the panel consists of plastic material and the unit (5) is held in its closed position with its panel region contacting the poster side of the rear-wall structure (4) and is held on the rear-wall structure sealed against the atmosphere by applying a vacuum.

4. Display case according to Claim 1, 2, or 3, characterized in that the frame (7) is provided with reinforcement (9).

5. Display case according to Claim 2, 3, or 4, characterized in that the rear-wall structure (4) has on the rear side of its poster-bearing wall (10) a vacuum channel (14), which is connected to the front side of the poster-bearing wall (10) via short channels (15) which extend along the perimeter of the wall, and which is connected to a vacuum pump (16).

6. Display case according to at least one of Claims 2-5, characterized in that the unit (5) is hinged to the rear-wall structure (4) by means of lateral hinge mechanisms (6) and can be brought into its end positions by means of an activation cylinder (18).

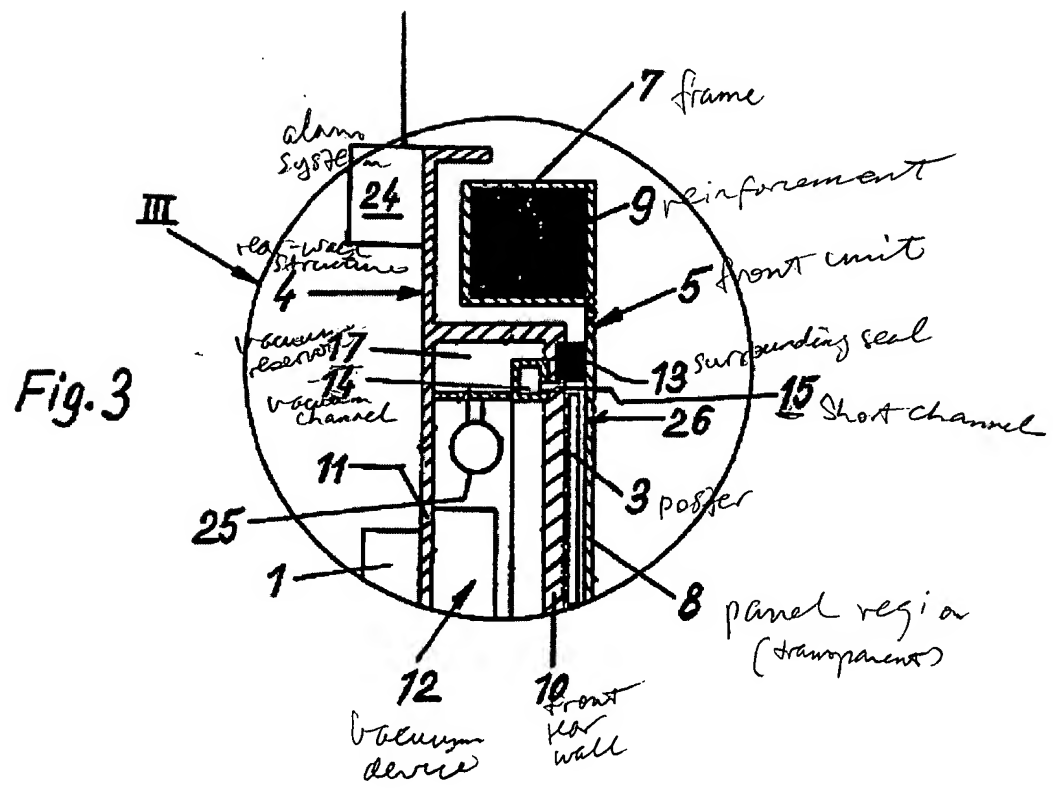
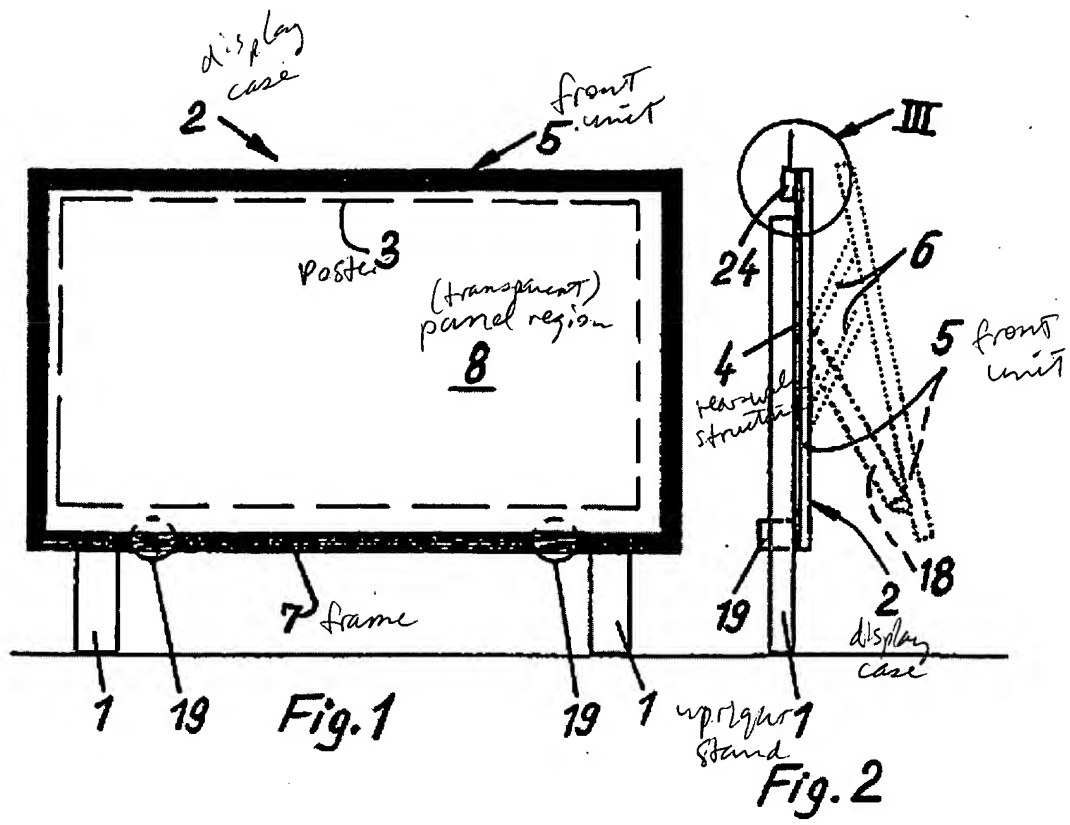
7. Display case according to at least one of Claims 2-6, characterized in that the unit (5) is secured in its connected position by means of vacuum-charged cylinders (19) provided with springs (29).

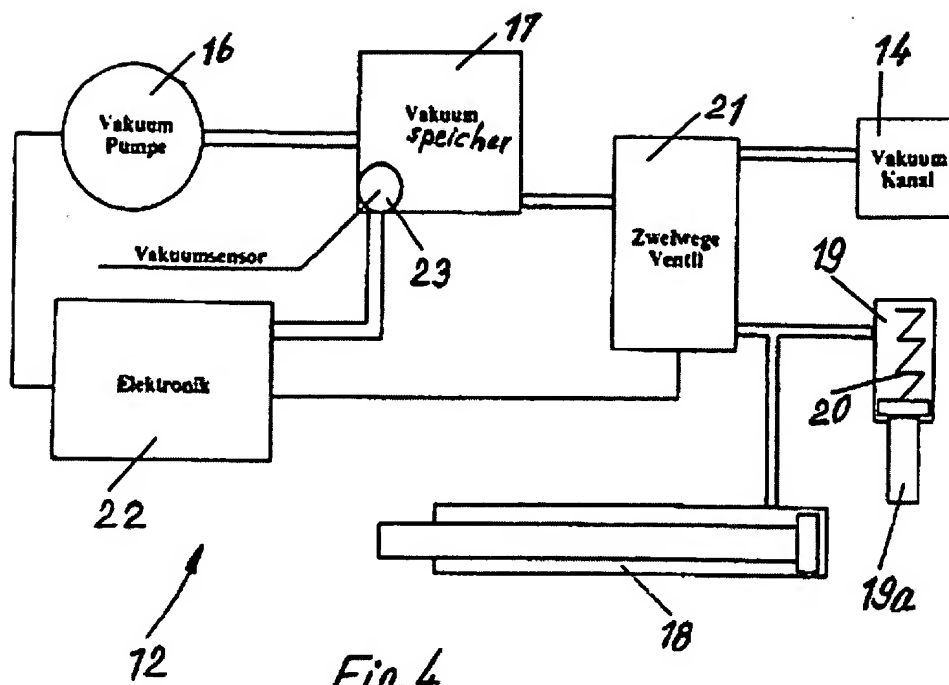
8. Display case according to at least one of Claims 1-7, characterized in that the unit (5) is provided on its outer side with a coating (26), which permits easy removal of malicious painting and/or dirt.

9. Display case according to at least one of Claims 1-8, characterized in that it is provided with an alarm system (24) for identifying a vacuum defect and/or a destructive outside effect.

10. Display case according to Claim 9, characterized in that the alarm system (24) is configured for transmitting a radio alarm signal of limited range for a service vehicle of a postering service.

11. Display case according to at least one of Claims 1-10, characterized in that the rear-wall structure (4) has a transparent front wall (10) and an illumination device (25) arranged behind this wall.





- Key:
- |    |                  |
|----|------------------|
| 14 | Vacuum channel   |
| 16 | Vacuum pump      |
| 17 | Vacuum reservoir |
| 21 | Two-way valve    |
| 22 | Electronics      |
| 23 | Vacuum sensor    |